

(12) UK Patent Application (19) GB (11) 2 336 480 (13) A

(43) Date of A Publication 20.10.1999

(21) Application No 9901931.7

(22) Date of Filing 28.01.1999

(30) Priority Data

(31) 98101540

(32) 29.01.1998

(33) WO

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(51) INT CL⁶

H01R 17/12 13/71

(52) UK CL (Edition Q)

H2E ECAAX E303

(56) Documents Cited

WO 98/31078 A1 FR 2733348 A

(58) Field of Search

UK CL (Edition Q) H2E ECAAX

INT CL⁶ H01R 13/71 17/12

ONLINE DATABASES: WPI,EPODOC

(54) Abstract Title

Coaxial switching connector

(57) A coaxial switching connector for use in cell phones is provided with a phone connector (4) for coupling with a cradle connector (10) in an axial direction. The connector is mounted to a casing (6) of a mobile device which is assembled relative to a printed circuit board (5). The phone connector has a centre contact (58) surrounded by an outer contact (66) and separated therefrom by a dielectric housing (84). A tapered funnel shaped lead in portion (94) of the outer contact (66) guides and locates the connector mating sections (86, 12) of the phone and cradle connectors during coupling. The phone connector is provided with resilient contacts (93, 95, 118) electrically connected to the centre and outer contacts. The resilient contacts have board contact portions (110, 112, 121) projecting from a face (83) of the housing (84) which contact portions abut against conductive traces on the circuit board.

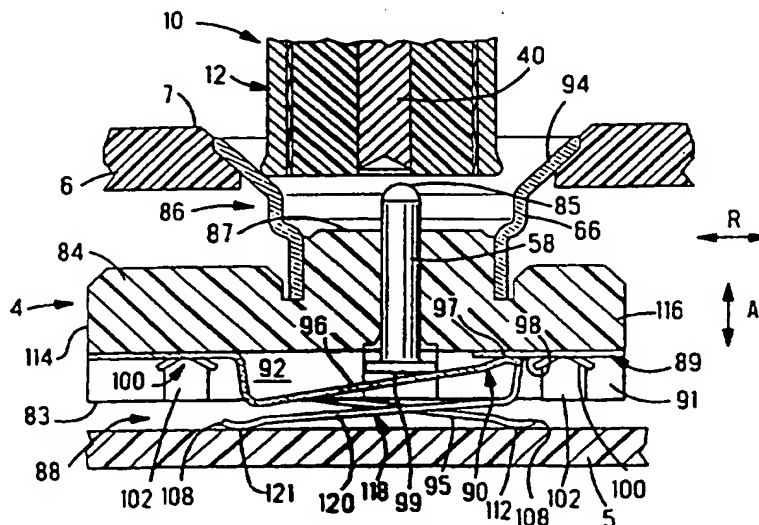


Fig. 3

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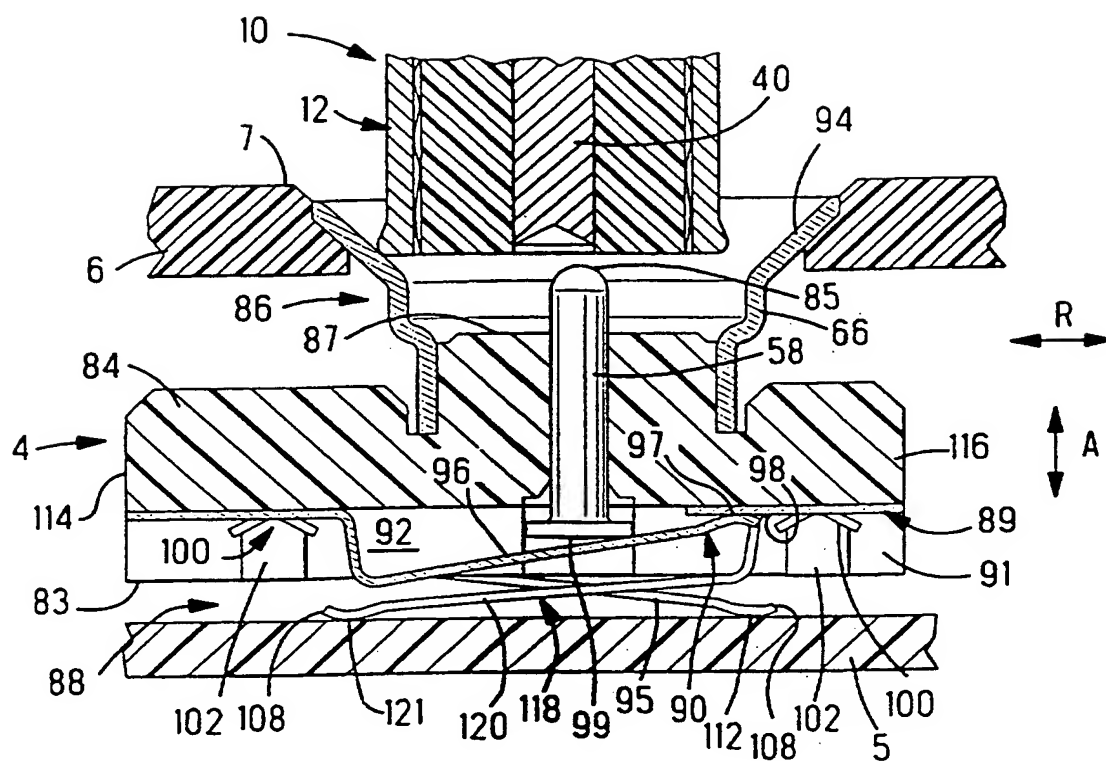


Fig. 3

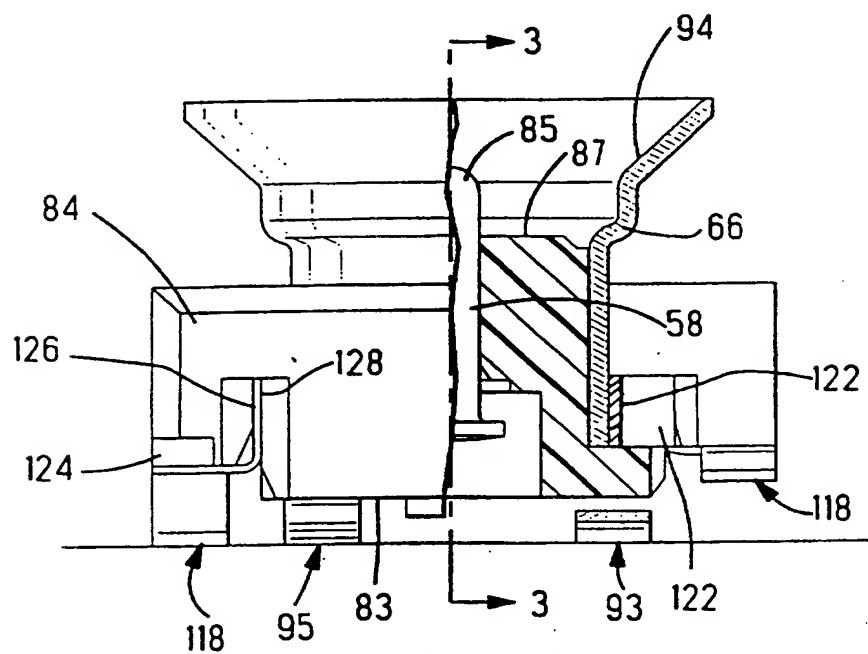


Fig. 4

resiliently movable in the axial direction against the resilient switching contact arm. The funnel shaped lead in portion extends beyond the outermost contact end of the inner contact, which only projects slightly beyond a mating face of the insulative housing. Advantageously, the inner or centre contact is well protected from external objects.

The provision of the axially movable centre contact of the cell phone connector that abuts the centre contact of the cradle connector enhances resistance to shocks and permits reliable connection for many plugging/unplugging cycles. Face to face abutment of centre contacts enables contacts to project only by small amounts from mating faces of the dielectric, thereby reducing the risk of bending or otherwise damaging the centre pin contacts.

Further advantageous aspects of the invention will be described in the claims, or will be apparent from the following description and drawings.

An embodiment of this invention will now be described by way of example with reference to the accompanying drawings, in which;

Figure 1 is side view of a connector according to this invention;

Figure 2 is a view in the direction of arrow 2 of figure 1;

Figure 3 is a cross-sectional view through line 3-3 of figure 4, additionally showing part of a second connector;

Figure 4 is a view in the direction of arrow 4 of figure 1 with a partial cross-sectional view through lines 4-4 of figure 1.

Referring to the Figures, a coaxial connector assembly 2 comprises a first or cell phone connector 4 mounted on a printed circuit board (PCB) 5 within a mobile device such as a portable phone (cell phone) having an outer housing 6 for reception in a device such as a telephone cradle within which a second connector 10 is mounted for mating with the first

centre contact 58 and centre contact 40 of the fixed device connector 10, enables the slidable contact end 85 to project only slightly beyond the mating face 87 of the dielectric 84. The latter reduces the risk of damage to the contacts during plugging, or with respect to external objects.

The outer contact 66 is provided with a large conical lead-in section 94 for guiding the complementary connector mating section 12 during plugging. The tapered or conical lead-in section 94 is quite substantial in order to absorb relatively large tolerances in radial positioning (R) of the connectors 4, 10.

The contacts 89, 90, which may be cost effectively manufactured from stamping and forming sheet metal, are provided with V-shaped retention members 100 that dig into opposed walls of a slot 102 in the mounting end 83 of the dielectric 84. The contacts can thus be securely attached and positioned with respect to the dielectric 84 by merely depressing the retention portions 100 into the slot 102.

The mobile device connector 4 is mounted securely to the casing 6, for example by overmoulding or latching of the outer conductor behind a latching shoulder or rim 7 as shown in figure 1 or 3.

The board contact portions 93, 95 are in the form of resilient beams integrally formed with the switching contact arm 96 and contact surface 98 respectively of the first and second contacts 89, 90 respectively. In this embodiment, the resilient beams 95, 96, 93 are in the form of cantilever beams, each attached at an end proximate the retention members 100 and extending therefrom to free ends 108. The board contact portions are each provided with contact surfaces 110, 112 respectively provided on protrusions proximate the free ends 108 for abutment against complementary circuit traces on the printed circuit board 5. Extensions of the resilient beams 93, 95 from proximate an end 114 to proximate an opposing end 116 of the connector

CLAIMS

1. A coaxial connector mountable in a mobile device for mating with a second coaxial connector in an axial direction, the connector comprising a mating section having an inner centre contact surrounded by an outer contact and separated therefrom by a dielectric housing, and a tapered funnel shaped lead-in portion for guiding and locating connector mating sections of the first and second coaxial connectors during plugging together, the connector being adapted to be mounted to a casing of the mobile device, the connector having resilient contacts electrically connected to the centre and outer contacts respectively, the resilient contacts having board contact portions projecting beyond a board mounting end of the dielectric housing for abutment against a circuit board of the mobile device.

2. The connector of claim 1, wherein the coaxial connector resilient contacts define first and second contacts, the second contact comprising a resilient switching contact arm for engaging a switching contact of the first contact when the connectors are unmated.

3. The connector of claim 2, wherein the resilient switching contact arm engages the centre contact of the coaxial connector when the centre contact is axially depressed during mating of the coaxial connectors.

4. The connector of any preceding claim, wherein the centre contact of the coaxial connector is substantially pin shaped and is resiliently movable in the axial direction.

5. The connector of claim 4, wherein the resiliency of the pin shaped centre contact is provided by abutment against the resilient switching contact arm.

12. A coaxial connector constructed substantially as hereinbefore described with reference to the accompanying drawings.